MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2015/2016

TOP2121 – OBJECT-ORIENTED PROGRAMMING

(All sections / Groups)

12 October 2015
2.30pm – 4.30pm
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 6 pages excluding the cover page.
2. Attempt FOUR out of FIVE questions. If you answered all five questions, only the first four questions will be marked.
3. All questions carry equal marks and the distribution of the marks for each question is given.
4. Please write your answers in the Answer Booklet provided.

QUESTION 1 (10 MARKS)

a) Every Java application must contain a `main` method. Write the method signature for the `main` method. Briefly discuss the meaning of the three modifiers in the `main` method.

(4 marks)

b) Give any THREE reasons why a constructor differs from a method.

(3 marks)

c) Given the definition for class `Music` below:

```
public class Music {
   private int id;
   private String name;

   public void printInfo() {
      System.out.println("The music is " + name);
   }
}
```

i) Create constructor for the class that initializes all its instance variables.
ii) Create an object for class `Music` that supplies value to all its instance variables.
iii) Call the printInfo method by using object you created in (ii).

(3 marks)

QUESTION 2 (10 MARKS)

a) Briefly discuss a difference between the procedure model and object model (You may provide diagram to show the difference between these two models).

(2 marks)

b) What is the purpose to use the keyword *super* in Java program? Write one important property of keyword *super*.

(3 marks)

c) Information hiding is one of the key features of object-oriented programming. How do you "hide the internal data" of an object? What happened if a class does not have access modifier?

(2 marks)

d) There is ONE error in the class B. Identify and explain about the error. Propose a possible fix.

```
1  class A{
2    final int k = 18;
3
4    void output(){
5        System.out.println("k = "+ k);
6    }
7  }
8
9  class B extends A {
10   int k = 26;
11
12   void output(){
13      System.out.println("k = "+ super.k);
14   }
15 }
```

(3 marks)

QUESTION 3 (10 MARKS)

a) List any TWO tasks that are usually done in the object-oriented implementation phase.

(2 marks)

b) The following figures illustrate a pair of classes for each case.

i.

ii.

iii.

State the most appropriate relationship between each pair of classes and draw the connections between them using the corresponding UML symbol.

(3 marks)

c) The `Printable` interface is given below. You are required to provide the implementation of the `Printable` interface that shows the message "Welcome to Java", where the word "Java" must be taken from the variable `P` in the `Printable` interface.

```
public interface Printable{
    String P = "Java";
    String getMessage();
}
```

(3 marks)

d) List TWO reasons why an exception needs to be handled.

(2 marks)

Continued...

QUESTION 4 (10 MARKS)

a) Use Case diagram provides a graphical description of who will use the system and what kinds of interactions to expect from the system. Briefly discuss any TWO components used in Use Case diagram.

(2 marks)

b) A restaurant is using a computerized system with the following main functionalities:

Waiter: receive the food order and serve the food.
Customer: order the food, eat the food and make payment. Payment can be made either with cash or credit card.
Cashier: receive payment from customer.

Draw the Use Case diagram of the system to show the various activities the users perform.

(4 marks)

c) Draw class diagrams based on the following Java code.

```
public class Point {
   private int x, y;

   public Point(int x, int y) {
      this.x = x;
      this.y = y;
   }
   public int getX() {
      return x;
   }
   public void setX(int x) {
      this.x = x;
   }
}
```

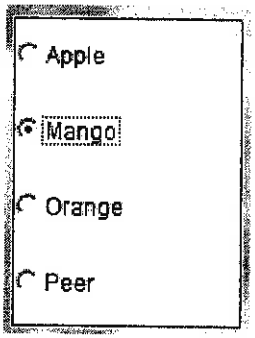
```
public class Line {
   private Point bg, ed;

   public Line(Point bg, Point ed)
   {
      this.bg = bg;
      this.ed = ed;
   }
   public String toString() {
      return "Line from " + bg +
      " to " + ed;
   }
}
```

(4 marks)

QUESTION 5 (10 MARKS)

a) Create a java function that return a panel containing a group of four radio button as follows:



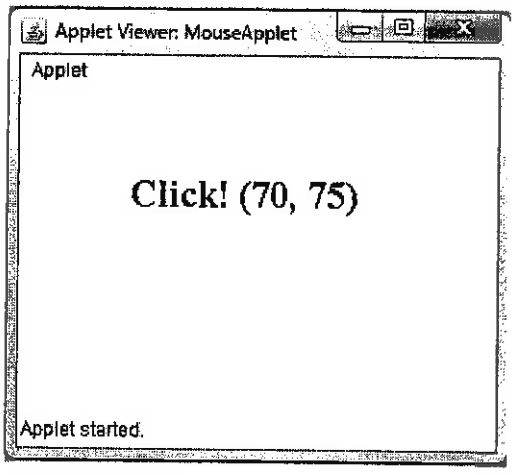
(4 marks)

b) Are the following method definitions allowed in Java? Briefly explain your answer.

```
public class TestClass{
   public int getNum( ) {...}
   public double getNum( ) {...}
}
```

(3 marks)

c) Complete the mouseClick( ) function that enable the Java applet captures the coordinate as shown below when the user clicks the mouse button.



(3 marks)

```
import java.awt.*;
import java.applet.*;
import java.awt.event.*;
```

Continued...

```
public class MouseApplet extends Applet implements MouseListener {
   int coordX, coordY;

   public void init() {
         coordX = -1;
         coordY = -1;
         Font font = new Font("TimesRoman", Font.BOLD, 20);
         setFont(font);
         addMouseListener(this);
         resize(200, 100);
   }

   public void paint(Graphics g) {
       if (coordX != -1){
          g.drawString("Click!  (" + coordX +", " + coordY + ")",
                       coordX, coordY);
       }
   }

   public void mouseClicked(MouseEvent e) {
        // write your code here
        
        
}

   public void mouseEntered(MouseEvent e){}
   public void mouseExited(MouseEvent e){}
   public void mouseReleased(MouseEvent e){}
   public void mousePressed(MouseEvent e){}
}
```

End of Paper